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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/780,989 | 02/09/2001 | Timothy G. Adams | 50376 | 5885 |

7590 09/16/2002
EDWARDS & ANGELL, LLP
Dike, Bronstein, Roberts & Cushman, IP Group
130 Water Street
Boston, MA 02109

EXAMINER

CLARKE, YVETTE M

| | |
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| ART UNIT | PAPER NUMBER |
|----------|--------------|

1752

DATE MAILED: 09/16/2002

8

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Applicati n N .

09/780,989

Applicant(s)

ADAMS ET AL.

Examiner

Yvette M. Clarke

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 26-48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 26-48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This is written in reference to application number 09/780989 filed on February 9, 2001 and published as US 2002/0012869 A1 on January 31, 2002.

Response to Amendment

1. Claims 1-25 have been cancelled. Claims 26-48 are currently pending.
2. The cancellation of the said claims is sufficient to overcome the rejections set forth under 35 USC 112, 2nd paragraph in the previous office action.
3. The papers filed on *June 18, 2002* (certificate of mailing dated *June 15, 2002*) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS ORIGINALLY FILED

If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in

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place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 28 and 41 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The said claims refer to "a tertiary non-cyclic alicyclic group". The specification teaches the use of a non-cyclic alkyl group on page 5, lines 11-15. However, the examiner has failed to find support for ^{+he claimed} ~~such a~~ group in the specification or in the originally filed claims.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

7. Claims 26-47 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims as written pertain to a polymer, which is "substantially free" of aromatic group. The examiner is unclear how much aromatic group can be present

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and still meet the limitation of being “substantially free”. The examiner has failed to find any guidelines in the specification by which to evaluate the term.

8. Claims 28 and 41 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Line 2 of each of the instant claims contains the phrase “a tertiary non-cyclic alicyclic group”. It is unclear to the examiner how an alicyclic group can be non-cyclic. Clarification is requested.

9. **The examiner notes that applicant has defined the term “crosslinking” and similar terms to refer to any covalent linkage between polymer chains or sites (see spec. pg. 3, l. 21-22). The following rejections are made in light of such a definition. **

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

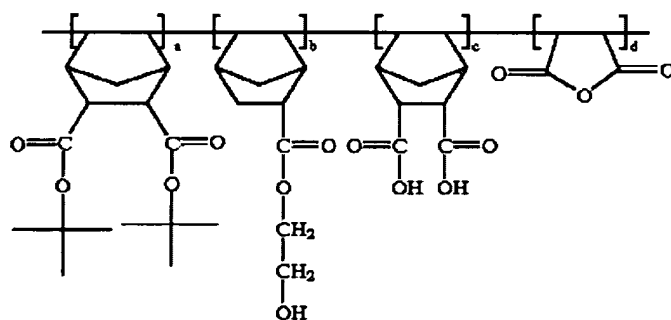
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

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11. Claims 26-30, 35-36 and 40-43 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Allen et al. (US 5,071,730 A). Allen teaches a polymer binder of t-butyl methacrylate/methyl methacrylate/ methacrylic acid and an initiator, which generates acid upon exposure to radiation. The given example teaches that the said photoresist is applied to a copper substrate and imaged with visible laser. The said photoresist also shows excellent sensitivity to UV light. It is the examiner's position that the t-butyl methacrylate meets the limitation of a photoacid labile group free of aromatic groups and the said copolymer is inherently crosslinked by the applicant's definition. The said initiator meets the limitations of a photoactive component.

12. Claims 26-30 and 35-43 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Jung et al. (US 6,391,518 B1). Example 2 of Jung exemplifies the synthesis of poly(di-tert-butyl 5 norbornene-2,3-dicarboxylate/2-hydroxyethyl 5-norbornene-2-carboxylate/5-norbornene-2,3-dicarboxylic acid/maleic anhydride having the given structure:

<Chemical Formula 102>



(c. 8, l. 25-67). The examiner directs the

applicant's attention to examples 3-13 also. Example 14 teaches that the polymer obtained in example 2 is admixed with a photoacid generator to form a resist composition. The said composition is spin-coated onto a silicon wafer; baked; exposed with an ArF laser exposing

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device (193 nm); post-baked; and developed to form a pattern. Alternatively, the KrF (248 nm), EUV (25 nm) or VUV (157 nm) may be used instead of ArF as a light source (c. 14, l. 35-50). It is the examiner's position that the t-butyl portion of the di-tert-butyl 5 norbornen-2,3-dicarboxylate monomer meets the limitation of a photoacid labile group free of aromatic units. The said copolymer is inherently crosslinked by the applicant's definition. The said photoacid generator meets the limitations of a photoactive component.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

14. Claims 47 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jung et al. (US 6,391,518 B1) as applied to claims 26-30 and 35-43 above, and further in view of Thackeray et al. (US 5,968,712 A). Jung as discussed above, teaches all the limitations of the instant claims except the use of a chemical etching step as set forth in instant claims 47 and 48. Jung pertains to a photolithographic process for the manufacture of a semiconductor device. It is the examiner's position that it is well known and conventional in the art to use a chemical etching process to alter the substrate bared by development. This position is supported by the background teachings of Thackeray which discloses that following the development of a photoresist coating, portions of the substrate bared by development maybe altered by chemical etching or plating (c. 1, l. 40-50). It would have

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been obvious to one of ordinary skill in the art to use a chemical etching process after development to render the formed pattern useful in the photolithographic field as it is well known and conventional in the art.

Allowable Subject Matter

15. Claims 31-3⁴~~2~~ are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: review of the prior art failed to find a crosslinking agent in combination with a polymer as claimed by the applicant.

Response to Arguments

17. Applicant's arguments with respect to the instant claims have been considered but are of little moment in view of the new ground(s) of rejection.

Conclusion

18. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Adams et al. (US 2002/0012869) which is the PG Publication of the instant application.
- Adams et al. (US 2001/0053496 A1) which pertains to a photoresist composition and use of the same.

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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20. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

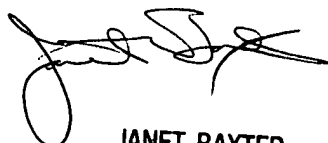
21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette M. Clarke whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

22. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

23. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1193.

ymc

September 10, 2002



JANET BAXTER
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700